W. Huggins

GAULT

AN UNUSUAL CASE OF OLFACTORY AND TACTILE SENSITIVITY

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AN UNUSUAL CASE OF OLFACTORY AND TACTILE SENSITIVITY[1]

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I SHALL describe a set of tests that I have made upon Willetta Huggins, a young girl in the State School for the Blind in Janesville, Wisconsin, and will state the conclusions that the tests appear to me to justify. The claims of remarkable capacities for sensory discrimination that this girl makes have come very largely into public notice through the press.

I will first state these claims:

1. That she is totally blind and totally deaf.

2. That after smelling at fabrics, excepting such as glass and glazed earthenware, she can name their colors. This capacity she claims to apply successfully even to distinguishing amongst sweet peas and zinnias.

3. That she can distinguish the denomination of bills and the newspaper headlines by the tactile sense.

4. That she can interpret human speech: (a) When vocal vibrations are conducted through a tube at the speaker's mouth, or through a solid pole, one end of which rests upon his head, to the palm of her hand; (b) when her fingers rest upon the head, shoulders or chest as well as when they are upon the larynx of the speaker; (c) when the tip of one of her fingers rests upon the diaphragm of the receiver of her portophone. I will say here that up to the present moment I have not examined into all of these claims, but that I hope to continue my studies in the near future.

Briefly, the history of the case and her physical and mental condition are as follows:

She was born on March 25, 1905. Her father died when she was four and her mother when the girl was nine years of age. She says that her father's death was caused by tuberculosis. I have been told by the superintendent of the school in Janesville that the mother suffered from a venereal infection. Beyond this, little is known of the girl's parents. Willetta was found in the summer of 1915 by a field worker for the School for the Blind. She was then ten years of age and was living with her grandmother in Eau Claire, Wisconsin. In September of that year she entered

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the school at Janesville because of defective vision. Later in the course of that autumn she was found to be of defective hearing especially on the right where there is a chronic suppurative otitis media. On that side there is an aperture of 2-3 mm. in the drum membrane and the malleus is said to be missing. It is alleged that in October of that year, after acute suppurative otitis media she completely lost her hearing on the left. She then became listless and apathetic and was sent to the University Clinic at Madison for observation. There she remained during several weeks and was pronounced "Incurably deaf and of a subnormal mentality of the moron type." (Quoted.)

The eye balls, a well-known oculist in Chicago tells me, are not so pathological but that she might see. Her pathological condition must lie back of the chiasm.

Early in 1920 a teacher of the blind in Eau Claire, Wisconsin, told the girl the story of Helen Keller and of Miss Keller's ability to interpret spoken language when holding her fingers upon the speaker's larynx. Willetta, it is said, was greatly encouraged. Her listlessness and apathy were soon conditions of the past, and she began to take a normal interest in her surroundings. She is mentally alert and very well developed physically, and is of generally healthy appearance. Naturally, she is somewhat retarded from the viewpoint of advancement in school (at present I believe she is pursuing first year high school studies), but, without having made a systematic mental test, I am convinced that it is extreme to classify her with the morons.

She is extremely temperamental. I mean by this that she is easily made resentful, easily depressed and made to cry. Oftentimes if the operator, even by chance, appears to intimate that he doubts her or that the test is a matter of very great seriousness, she will fall into an emotional state that is at once prejudicial to a conclusive test. The method, to be successful, must appeal to her as a novel form of play, or it must afford her an opportunity to show off before strangers.

To pass on to my own tests. I first occupied myself, while I was in Janesville during two weeks in July 1922, with a study of her alleged capacity to name the colors of Holmgren yarns after having smelled them.

To eliminate the chance that she may see, it is obvious that the dark room would first occur to me as a means of control. But if one is seriously looking for evidence of olfactory sensitivity such a room must have a free circulation of fresh air. This condition could not be satisfactorily met in the school. Furthermore, there

is the probability, based upon knowledge of earlier experience, that being placed in a dark room for purposes of testing would arouse an unfavorable emotional reaction.

I therefore, at the outset, resorted to the bandage as an expedient, in the expectation that, as the work should proceed, opportunities would arise to alter or to add to the control and at the same time to maintain the subject in good humor. The bandage consisted in a pair of automobile goggles of the cup-shaped variety, lined with black paper, stuffed with cotton wool and bound around the head with stiff elastic. The cotton wool projected over the temples and brows and below almost to the point of her nose. It was impossible either for me or for one of my graduate students, who accompanied me as assistant, while wearing the bandage to peek underneath it or to distinguish through it a lighted window from a dark wall. While she was bandaged in this manner I threw upon the table before her a pile of 90 yarns without selection and asked her to pick out all that were blue or "on the order of blue." It turned out that there were 22 in the heap that could be properly so described. Four of them she failed to find. She succeeded exactly in selecting the 13 that were red and a tint of red. There were nineteen that were yellow: tints, shades and mixtures. These she selected correctly. From time to time she described one as lighter or darker than another. She placed an orange yarn with the yellow group remarking as she did so that she could have included it with the red group.

I then found a pretext for adding adhesive plaster to the bandage already described. A strip two inches wide was used for this purpose. Its lower edge was firmly attached to the skin below the cotton wool. It effectively covered the wool that projected below the goggles and extended right and left over the nose to within a half inch of each ear. She continued to name the colors as before.

There was the possibility that she gained some clues by contact with the skin. To control this factor I undertook holding the yarns myself close to her nose but without touching her skin. She was unsuccessful. She said "the smell goes out into the air."

I then provided myself with a glass tube with an inside diameter of ⅜ of an inch, 5 inches long and bent 1½ inches from one end to form a right angle. While Willetta held the short arm of the tube in one nostril—the left—I held twenty-five colored yarns one after another with a pair of tweezers tightly against the outer end approximately 4½ inches before her face. The outer end of the tube was elevated so that it was very nearly on a level with the

middle of her nose. The box from which the yarns were taken was situated on a level with the outer end of the tube and directly in front of the subject. She named correctly the color of each of 30 yarns presented in this manner.

In the course of this test I was surprised to find that whenever the tube was in the right nostril the girl was unsuccessful in naming the colors of the yarns. The test began at two o'clock on an afternoon. On inquiry I discovered that her nose had bled immediately after luncheon. Later she was able to make the distinctions whether she was using the left or the right nostril.

In this connection I should say that the subject never reported the color of pieces of glass whether the experimenter or the subject held them at the end of the glass tube or directly against her nose.

At this point the subject caught a severe cold and suffered from prolonged congestion and inflammation of the nasal passages. Further tests in which the subject claimed to rely upon smell were interrupted necessarily. She claimed to be unable to make distinctions of color in the usual manner, or in any other manner whatever while she was in this condition and our attempts resulted in complete failure.

When colored lights are reflected upon any portion of her face or into her nostrils there is no reaction.

Before going on to other aspects of the case I will suggest an interpretation of the phenomena I have described to this point.

This interpretation must be made, I am convinced, on the theory that the energy of light reflected from the colored yarns was wholly excluded from her retinae. My confidence in this is established by the following facts: (1) neither my assistant, Mr. Roy Smyres, nor I could detect light through the bandage even without the adhesive plaster addition; (2) twenty students in Northwestern University, with such a bandage over their eyes, were unable to distinguish a brightly lighted window from a dark wall; (3) a third well known fact must be mentioned: ability to distinguish faint white light is quite consistent with inability to distinguish colored lights.

Naturally one dwells upon the hypothesis that the dyes used in these yarns have odors that are distinguishable by one who has an extraordinarily keen sense of smell.

To test this hypothesis I examined, in the course of the summer, a total of 32 persons, ten of whom were blind, to discover whether there were any amongst them who could report with a high degree of accuracy upon the olfactory likeness or difference of tufts of Holmgren yarns. Fifty pairs of yarns were chosen for the test.

The members of the pairs respectively were different and alike in an equal number of instances. In each case one subject was blindfolded. He smelled at one and then the other member of the pair and reported whether they appeared to be alike or different. No one has been found who can name the colors in such a test. Willetta's special teacher made correct reports in 45 of the 50 cases. This teacher, a young woman of high attainment, a graduate of the University of Chicago, came to the institution on the day of my own arrival. Her attitude toward the case was, from beginning to end, that of an inquiring rather than of a credulous mind. My assistant was successful in 18 out of 24 cases, and my notes show that two blind pupils in the school were successful in 30 out of 50 cases. The superintendent succeeded in 44 cases. I should add that the yarns I used in all these tests were from a new set, the property of the psychological laboratory in Northwestern University.

Now it is probable that our deaf-blind subject need not have been more sensitive in respect of smell than her teacher at the onset of her blindness. If she were just as sensitive as her teacher and no more she might learn in the sewing room to distinguish colors by the odors of the dyes—and do it even without the *conscious* guidance of the instructor. Attempts are being made at the Janesville School to teach other pupils to make these distinctions by smell. It is too early to speak of results. It appears, however, in one or two individual cases that the experiment may not be wholly unpromising.

The possibility that our subject is, and always has been, synesthetic as to odors and colors (assuming as high a degree of sensitivity as that of her teacher) is worth consideration. It must be recalled that the girl was not blind before she was ten years old. Whether she is synesthetic in this respect I am unable to determine. If in her childhood, before the age of ten, she invariably connected odors and colors, and the same odor with the same color, she does not recall it—and she could hardly be expected to do so even if it were the fact; for as long as she could see she might easily overlook, or forget, at any rate, the synesthetic phenomenon if, indeed, it existed at all.

I must admit that the great number of dye substances in use in industry puts a heavy burden upon the applicability of the theory that she distinguishes the colors of fabrics on the basis of differences of odor amongst dyes. My own work with her in this relation has been limited practically to tests in which the fabrics employed as stimuli were colored with aniline dyes. But I express

again my conviction that no light reflected from the fabrics reached her retinae. In view of all the circumstances I can conceive of no other hypothesis than the one I have mentioned.

The possibility will occur to some that telepathic communication from the experimenter accounts for the girl's discriminations in these tests. This assumed factor, I urge, has been controlled in the unsuccessful attempts to have her discriminate colored glass and colored lights. As a further test upon this point, I shall attempt to have her discriminate colored yarns in circumstances in which the experimenter himself cannot know, at the moment, what stimulus he is presenting.

In the next place I shall speak briefly of Willetta's claim that she interprets speech through vibrations conducted to the palm of her hand or to her finger tips. On the afternoon and evening of December 16 I had opportunity to put this matter to the test. Because of the novelty of the test in her experience we easily gained her hearty coöperation. Mr. George Crane, one of our graduate students, assisted me. I myself took the transmitter of Willetta's portophone into a closet and closed the door upon the wire. I covered myself and the transmitter tightly with a heavy comforter. Willetta, outside the door, had her ears stopped with cork, and a heavy double woolen blanket was bound around her head and neck. Outside the blanket she held the receiver, with a finger against the diaphragm. I recited seven short sentences and five questions into the transmitter. After each sentence or question was completed her blanket was raised and she repeated to the assistant what had been said with but a few unimportant variations. When, subsequently the assistant was bound up as Willetta had been, he could not hear my voice. I believe we have here a satisfactory demonstration that she interprets the human voice through vibrations against her fingers.

Evidence to corroborate this conclusion Mr. Crane is finding in the course of experiments in the psychological laboratory at Northwestern. He has succeeded in teaching a normal subject to distinguish twenty-three words by means of the vibrations of his own voice conducted through a speaking tube, thirteen feet long, and projecting through two walls and an intervening room, against the palm of the subject's hand. The hand is inclosed in a soundproof box and the subject's ears are stopped by soft putty and covered by a soft bandage. By the time this statement is printed he will, if the present rate is maintained (and the rapidity of learning is increasing) be able to distinguish many more than twenty-three words. I should add that it matters not, for accuracy

of discrimination, whether the words are isolated or combined to form sentences. Furthermore, it is utterly impossible for the subject or for any other person who has been introduced as subject for purposes of control to distinguish the experimenter's voice by the ordinary means.

The experiment, I believe, may lead to important results from the viewpoint of teachers of the deaf.

NOTE.—Since the above was written the subject has made additional progress. He is able to understand 35 words in isolation and any number of sentences that may be made of them. He distinguishes low, middle and high notes.

Through the generosity of the Dictograph Products Corporation and the Portophone Company, both of New York City, we are able to begin experiments with their acousticon-like instruments. The subject holds the ear-piece in his hand, and he has shown, in two sittings, indication that he will be able to learn to interpret speech by means of tactile impressions conveyed to the palm from the vibrating diaphragm.

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